



U.S. NUCLEAR REGULATORY COMMISSION

STANDARD REVIEW PLAN

OFFICE OF NUCLEAR REACTOR REGULATION

6.6 INSERVICE INSPECTION OF CLASS 2 AND 3 COMPONENTS

REVIEW RESPONSIBILITIES

Primary - ~~Materials Engineering Branch (MTEB)~~Civil Engineering and Geosciences Branch (ECGB)¹

Secondary - ~~None~~Materials and Chemical Engineering Branch (EMCB)²

I. AREAS OF REVIEW

General Design Criterion 36, "Inspection of Emergency Core Cooling System"; Criterion 39, "Inspection of Containment Heat Removal System"; Criterion 42, "Inspection of Containment Atmosphere Cleanup Systems"; and Criterion 45, "Inspection of Cooling Water System," of Appendix A to 10 CFR Part 50 require that the subject systems be designed to permit appropriate periodic inspection of important component parts to assure system integrity and capability. General Design Criterion 37, "Testing of Emergency Core Cooling System"; Criterion 40, "Testing of Containment Heat Removal System"; Criterion 43, "Testing of Containment Atmosphere Cleanup Systems"; and Criterion 46, "Testing of Cooling Water System," require in part that the subject systems be designed to permit appropriate periodic pressure testing to assure the structural and leaktight integrity of their components.

Inservice inspection (ISI)³ programs are based on the ~~general~~⁴ requirements of 10 CFR Part 50, Section 50.55a, ~~as detailed in~~ that Code Class components meet the applicable inspection requirements set forth in⁵ Section XI of the ASME Code (Reference 16)⁶, "Rules for Inservice Inspection of Nuclear Power Plant Components." Inservice inspection includes a preservice inspection prior to initial plant startup.

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USNRC STANDARD REVIEW PLAN

Standard review plans are prepared for the guidance of the Office of Nuclear Reactor Regulation staff responsible for the review of applications to construct and operate nuclear power plants. These documents are made available to the public as part of the Commission's policy to inform the nuclear industry and the general public of regulatory procedures and policies. Standard review plans are not substitutes for regulatory guides or the Commission's regulations and compliance with them is not required. The standard review plan sections are keyed to the Standard Format and Content of Safety Analysis Reports for Nuclear Power Plants. Not all sections of the Standard Format have a corresponding review plan.

Published standard review plans will be revised periodically, as appropriate, to accommodate comments and to reflect new information and experience.

Comments and suggestions for improvement will be considered and should be sent to the U.S. Nuclear Regulatory Commission, Office of Nuclear Reactor Regulation, Washington, D.C. 20555.

The following areas relating to the inservice inspection (ISI)⁷ program for NRC Quality Group B and C (ASME Boiler and Pressure Vessel Code, Section III, Code Class 2 and 3) components are reviewed:

1. Components Subject to Examination

The descriptive information in the applicant's or licensee's safety analysis report (SAR) is reviewed to establish that all the ASME Boiler and Pressure Vessel Code (hereinafter "the Code"), Section III, Article NCA-2000, "Classification of Components," (Reference 15)⁸ Class 2 and Class 3 components are included in the ISI program. ~~The Mechanical Engineering Branch verifies in SRP Section 3.2.2 that the systems classified as Code Class 2 and 3 agree with Article NA-2000 of Section III and with the definitions of the General Design Criteria. The inservice inspection requirements for ASME Code Class 1 components in the reactor coolant pressure boundary and steam generator tubes are reviewed by MTEB as part of its primary review responsibility for SRP Sections 5.2.4 and 5.4.2.2, respectively.~~⁹

2. Accessibility

The descriptive information, including drawings, is reviewed by the ~~MTEB~~ ECGB¹⁰ to establish that the Code Section XI, Subarticle IWA-1500, "Accessibility,"¹¹ provisions for system accessibility are included in the applicant's or licensee's layout and design of these systems.

3. Examination Categories and Methods

The required examination categories and methods included in Articles IWA-2000, IWC-2000, and IWD-2000, "Examination and Inspection,"¹² of Section XI are reviewed.

4. Inspection Intervals

The required examinations and inspections listed in the SAR and/or plant Technical Specifications¹³ are reviewed and compared to the requirements in Articles¹⁴ IWA-2000, IWC-2000,¹⁵ and IWD-2000 of Section XI to verify that they will be performed within the designated inspection interval.

5. Evaluation of Examination Results

The information concerning repair procedures is reviewed for compliance with Articles ~~IWC-4000 and IWA-4000~~, "Repair Procedures,"¹⁶ of Section XI. The information concerning evaluation of examination results is reviewed for compliance with Articles¹⁷ IWC-3000, "Acceptance Standards,"¹⁸ and IWD-3000, "Acceptance Standards,"¹⁹ of the Code. If these requirements are in course of preparation in the applicable Code edition for a program, suitable alternative provisions, such as the requirements in Article²⁰ IWB-3000 or those in later approved editions of the Code, should be proposed by the applicant or licensee.

6. System Pressure Tests

The pressure test program is reviewed for compliance with Articles IWC-5000, "System Pressure Tests,"²¹ and IWD-5000, "System Pressure Tests,"²² of Section XI to establish that leakage and signs of structural distress are inspected for on a periodic basis.

7. Augmented ISI to Protect Against Postulated Piping Failures

The augmented inservice inspection program as specified in SRP Section 3.6.4²³ to provide assurance against postulated piping failures of high-energy fluid systems between containment isolation valves is reviewed.

8. Code Exemptions

The ASME Section XI Code exemptions as permitted by Subsubarticles IWC- or IWD-1220, "Components Exempt from Examination,"²⁴ are reviewed.

9. Relief Requests

Requests for relief from the ASME Code Section XI examination requirements which are found to be impractical due to the limitations of design, geometry, or materials of construction of components are evaluated in accordance with Section 50.55a of 10 CFR Part 50.

Review Interfaces²⁵

ECGB also performs the following review under the SRP section indicated:

The preservice and inservice inspection requirements for ASME Code Class 1 components in the reactor coolant pressure boundary are reviewed as part of the primary review responsibility for SRP Section 5.2.4, "Reactor Coolant Pressure Boundary Inservice Inspection and Testing."²⁶

In addition, the ECGB will coordinate with other branch evaluations that interface with the overall review of this section as follows:

1. The Mechanical Engineering Branch (EMEB) verifies, under SRP Section 3.2.2, "System Quality Group Classification," and SRP Section 5.2.1.1, "Compliance with the Codes and Standards Rule, 10 CFR 50.55a," that systems and components are appropriately classified in accordance with regulatory requirements and NRC quality group classification guidance including verification that quality group B and C components meet the requirements for Code Class 2 and 3 components, respectively. The EMEB will also verify, under SRP Section 5.2.1.2, the acceptability of any ASME Code Cases that the applicant may have invoked in connection with the ISI program.²⁷

2. The EMCB reviews the adequacy of programs for assuring the integrity of bolting and threaded fasteners as part of its primary review responsibility for SRP Section 3.13, "Threaded Fasteners" (proposed).²⁸
3. The EMCB reviews the ISI requirements for the steam generator tubes as part of its primary review responsibility for SRP Section 5.4.2.2, "Steam Generator Tube Inservice Inspection."²⁹
4. The Plant Systems Branch (SPLB) reviews the plant programs for surveillance, testing, inspection and maintenance of service water systems under SRP Section 9.2.1. These programs may be coordinated with the ISI program reviewed under SRP Section 6.6.³⁰

For those areas of review identified above as part of the review under other SRP sections, the acceptance criteria necessary for the review and their methods of application are contained in the referenced SRP sections.³¹

II. ACCEPTANCE CRITERIA

The requirements for periodic inspection and testing of Class 2 and 3 systems in General Design Criteria 36, 37, 39, 40, 42, 43, 45, and 46 are specified in part in 10 CFR Part 50, Section 50.55a, "Codes and Standards," and detailed in Section XI of the ASME Code. Compliance with the preservice and inservice examinations of 10 CFR Part 50, Section 50.55a, as detailed in Section XI of the Code, constitutes an acceptable basis for satisfying in part the requirements of General Design Criteria 36, 37, 39, 40, 42, 43, 45, and 46. Specific acceptance criteria for meeting the ISI requirements of these General Design Criteria and 10 CFR Part 50, Section 50.55a for the areas of review described in subsection I of this SRP section are as follows:

1. Components Subject to Inspection

The applicant's or licensee's definition of Code Class 2 and 3 components and systems subject to an ISI program is acceptable if it is in agreement with the NRC quality group classification system or the³² definitions of Code Section III, Article NCA-2000, "Classification of Components."³³ ~~The interpretation of code~~ classifications of components³⁴ by the applicant or licensee is subject to review by the ~~Mechanical Engineering Branch~~ ~~EMEB~~³⁵ in SRP Section 3.2.2 for compliance with safety criteria pertaining to component classification. Where a specific item will be subject to inspection requirements different in any way from the ASME Code Section XI requirements corresponding to the item's Code Class, the exceptions for the item, including the ISI requirements to be applied, should be clearly identified and described. Exceptions involving less stringent inspection requirements for Code Class 2 or 3 items than those required by Section XI must be adequately justified.³⁶ (Refer to SRP Section 3.2.2 or Article NCA-2000 of Code³⁷ Section III.)

2. Accessibility

The design and arrangement of Class 2 and 3 systems ~~are acceptable if the applicant or licensee includes~~ should include allowances for adequate clearances to conduct the examinations specified in Articles³⁸ IWC-2000 and IWD-2000 at the frequency specified. The design and arrangement of system components are acceptable if adequate clearance is provided in accordance with Subarticle IWA-1500, "Accessibility," of the Code.³⁹ Special design considerations are given to those systems that are intended to be examined during normal reactor operation.

3. Examination Categories and Methods

The examination categories and requirements specified in the SAR are acceptable if in agreement with the criteria of Articles⁴⁰ IWA-2000, IWC-2000,⁴¹ and IWD-2000 of the Code. Every area subject to examination should fall within one or more of the examination categories and must be examined at least to the extent specified. The methods of examination for the components are also listed in the requirements of Articles⁴² IWA-2000, IWC-2000,⁴³ and IWD-2000 of the Code.

The applicant's or licensee's examination techniques and procedures used for preservice inspection (PSI)⁴⁴ or ISI are acceptable if in agreement with the following criteria:

- a. The methods, techniques, and procedures for visual, surface, or volumetric examination are in accordance with Article⁴⁵ IWA-2000, "Examination and Inspection,"⁴⁶ of the Code.
- b. Alternative examination methods, combination of methods, or newly developed techniques to those given in a. above are acceptable provided that the results are equivalent or superior. The acceptance standards for these alternate methods are given in Section XI, Articles⁴⁷ IWC-3000, "Acceptance Standards,"⁴⁸ and IWD-3000, "Acceptance Standards."⁴⁹
- c. The methods, procedures and requirements regarding qualification of personnel performing ultrasonic examination reflect the guidance provided in Appendix VII to Division 1 of Section XI of the ASME Code.⁵⁰

4. Inspection Intervals

The inservice inspection program schedule given in the SAR is acceptable if the required examinations and pressure tests⁵¹ are completed during each ten year interval, hereinafter designated as the inspection interval, and as required by Articles IWA-2000, IWC-2000,⁵² and IWD-2000 of Section XI.

5. Evaluation of Examination Results

The methods for evaluation of examination results are reviewed for compliance with Articles IWC-3000 and IWD-3000 in the Code. If the applicable edition of the Code

states that these articles are in the course of preparation, the rules of Article⁵³ IWB-3000 shall apply. The repair procedures are acceptable if in compliance with Article IWA-4000, "Repair Procedures," of Section XI.⁵⁴

6. System Pressure Tests

The SAR program for Class 2 and 3 system pressure testing is acceptable if it meets the criteria of Articles⁵⁵ IWC-5000, "System Pressure Tests,"⁵⁶ and IWD-5000, "System Pressure Tests,"⁵⁷ of Section XI.

7. Augmented ISI to Protect Against Postulated Piping Failures

High-energy fluid system piping between containment isolation valves should receive an augmented ISI as follows:

- a. Protective measures, structures, and guard pipes should not prevent the access required to conduct the inservice examinations specified in the Code, Section XI, Division 1.
- b. For those portions of high energy fluid system piping between containment isolation valves, the extent of inservice examination completed during each inspection interval should provide 100% volumetric examination of circumferential and longitudinal pipe welds within the boundary of these portions of piping.
- c. For those portions of high-energy fluid system piping enclosed in guard pipes, inspection ports should be provided in the guard pipes to permit the required examination of circumferential pipe welds. Inspection ports should not be located in that portion of the guard pipe passing through the annulus of dual barrier containment structures.
- d. The areas subject to examination should be defined in accordance with Examination Categories C-F and C-G for Class 2 piping welds in Article IWC-2000.

8. Code Exemptions

The applicant or licensee should list the exemptions from Code examination requirements that have been permitted by Subsubarticles IWC- or IWD-1220, "Components Exempt from Examination,"⁵⁸ of the Code.

9. Relief Requests

Request for relief from the ASME Code Section XI examination requirements which are found to be impractical due to the limitations of design, geometry, or materials of construction of components are evaluated in accordance with Section 50.55a of 10 CFR Part 50.

Technical Rationale⁵⁹

The technical rationale underlying the application of the above stated acceptance criteria for the inservice inspection programs of ASME Code Class 2 and Code Class 3 systems is discussed in the following paragraphs.

1. 10 CFR 50.55a, "Codes and Standards," requires, in paragraph (a)(1), that structures, systems and components (SSCs) be designed, fabricated, erected, constructed, tested, inspected and maintained to quality standards commensurate with the importance of the safety function they are intended to perform. 10 CFR 50.55a(b) incorporates, by reference, the ASME Boiler and Pressure Vessel Code. Throughout the service life of a boiling or pressurized water cooled nuclear power reactor, its Code Class 2 and Class 3 systems and components must meet the requirements of Section XI of the ASME Boiler and Pressure Vessel Code. 10 CFR 50.55a(g) addresses Inservice Inspection Requirements. Section XI defines, for each Code Class, the time interval for inservice inspection, the scope of the inspection activity, the inspection sample, sample selection methodology, the method of inspection, the acceptance criteria for various types and sizes of material flaws identified during the inspection, and various other related technical details required for properly performing the required inservice inspection activity. Compliance with the requirements of 10 CFR 50.55a ensures that periodic inspections will be performed on all Class 2 and class 3 components for the purpose of detecting incipient degradations, leakage, indications of mechanical or structural distress caused by aging, fatigue and/or corrosion, prior to jeopardizing the ability of the affected systems or components to perform their intended safety functions.
2. General Design Criteria 36, 37, 39, 40, 42, 43, 45 and 46 require that the respective safety systems addressed by these criteria be designed such that they permit periodic inspection, pressure testing and functional testing of system components and piping. Specific functional classes of components for each of the safety systems addressed are identified in the General Design Criteria. The inservice inspection program for Class 2 and Class 3 components relies upon these design provisions to allow performance of inservice inspections. Compliance with these General Design Criteria ensures that the design of the safety systems will allow accessibility of important components so that periodic inspections can be performed that detect degradation, leakage, signs of mechanical or structural distress caused by aging, and fatigue or corrosion, prior to jeopardizing the ability of the systems to perform their intended safety functions.

III. REVIEW PROCEDURES

The reviewer will select and emphasize material from the procedures described below, as may be appropriate for a particular case.

~~For each area of review t~~The following review procedures ~~is~~⁶⁰ followed:

1. Components Subject to Inspection

The applicant's or licensee's components and system classifications under Class 2,⁶¹ the corresponding proposed inspection requirements for each classification, and the proposed exceptions are reviewed for agreement with subsection II.1 of this SRP section as the basis for determining the acceptability of component inclusion under the ISI program⁶². The interpretation of Code verification of acceptable component classifications is the responsibility of the Mechanical Engineering Branch EMEB in the review of under SRP Section 3.2.2, should a discrepancy occur between the SAR and subsection II.1 of this SRP section.⁶³

~~The applicant's or licensee's classification of Class 3 systems is reviewed for agreement with subsection II.1 of this SRP section. Any safety-related, fluid-carrying, components not included in Class 1 or Class 2 and not a part of the containment structure are included in Class 3.~~⁶⁴

2. Accessibility

The design and arrangement of Class 2 and 3 systems are reviewed in terms of accessibility for ISI to establish that the design meets the requirements of subsection II.2 of this SRP section. No remote inspection program is required for Code Class 2 or 3 components.

3. Examination Categories and Methods

The reviewer verifies that the examination categories and methods as described by the SAR are the same as those specified in subsection II.3 of this SRP section.

The reviewer verifies that the training and requalification portion of the ISI program is in conformance with applicable portions of Division 1 of Section XI of the ASME Code. Qualification of personnel performing ultrasonic examinations should contain the elements of Appendix VII (July 1989 or later Edition), "Qualification of Nondestructive Examination Personnel for Ultrasonic Examination."⁶⁵

With respect to ultrasonic examination systems for new applications, the reviewer ascertains that the ISI program encompasses the elements set forth in Appendix VIII, "Performance Demonstration for Ultrasonic Examination Systems," to Section XI, Division 1 of the ASME Code (March 1990 Addenda to the July 1989 Edition, or later).⁶⁶

The reviewer also verifies that an appropriate long term monitoring program for potential wall thinning of high energy piping by erosion/corrosion, pursuant to Generic Letter 89-08 (Reference 14) and NUREG-1344 (Reference 11), has been incorporated into the ISI program.⁶⁷

4. Inspection Intervals

The ~~in-service inspection~~ ISI⁶⁸ program for Class 2 and 3 components in the plant technical specifications is reviewed to establish that each area and component in the program is inspected on a schedule in agreement with subsection II.4 of this SRP section.

5. Evaluation of Examination Results

The reviewer verifies that the evaluation of examination results described in the SAR is in accordance with subsection II.5 of this SRP section.

6. System Pressure Test

The system pressure test program is acceptable if it meets the criteria of subsection II.6 of this SRP section.

7. Augmented ISI to Protect Against Postulated Piping Failures

The reviewer verifies that the augmented ~~in-service inspection~~ ISI⁶⁹ program as described in the SAR meets the acceptance criteria identified in subsection II.7 of this SRP section.

8. Code Exemptions

The reviewer verifies that the exemptions from Code examinations are in accordance with the criteria in Subsubarticles IWC- or IWD-1220, "Components Exempt from Examination."⁷⁰

9. Relief Requests

The reviewer determines if the applicant or licensee has demonstrated that a code requirement is impractical due to the limitations of design, geometry, or materials of construction of components.

10. Augmented Inspection of BWR Piping Susceptible to IGSCC

For ISI programs at BWR plants, the reviewer ascertains that the staff positions concerning augmented inspections for intergranular stress corrosion cracking (IGSCC) provided in NUREG-0313 Revision 2, Generic Letter 88-01, and Supplement 1 to Generic Letter 88-01 (References 10, 12, and 13, respectively) have been adequately addressed.⁷¹

For standard design certification reviews under 10 CFR Part 52, the procedures above should be followed, as modified by the procedures in SRP Section 14.3 (proposed), to verify that the design set forth in the standard safety analysis report, including inspections, tests, analysis, and acceptance criteria (ITAAC), site interface requirements and combined license action items, meet the acceptance criteria given in subsection II. SRP Section 14.3 (proposed) contains procedures for the review of certified design material (CDM) for the standard design, including the site parameters, interface criteria, and ITAAC.⁷²

IV. EVALUATION FINDINGS

The reviewer verifies that sufficient information has been provided in accordance with the requirements of this SRP section and that his⁷³ evaluation supports conclusions of the following type, to be included in the staff's safety evaluation report:

To ensure that no deleterious defects develop during service in ASME Code Class 2 system components, selected welds and weld heat-affected zones are inspected prior to reactor startup and periodically throughout the life of the plant. In addition, Code Class 2 and 3 systems receive visual inspections while the systems are pressurized in order to detect leakage, signs of mechanical or structural distress, and corrosion.

The applicant (licensee) has stated that his⁷⁴ inservice inspection (ISI) program will comply (complies) with the rules published in 10 CFR Part 50, Section 50.55a, and Section XI of the ASME Code, () Edition, including addenda through the () Addenda. The ISI program will consist of a preservice inspection plan and an inservice inspection plan.

Examples of Code Class 2 systems are: residual heat removal systems, portions of chemical and volume control systems (in PWR plants), portions of control rod drive systems (in BWR Plants), and engineered safety features not part of Code Class 1 systems. Examples of Code Class 3 systems are: component cooling water systems and portions of radwaste systems. All of these systems transport fluids.

The staff concludes that the inservice inspection program is acceptable and meets the inspection and pressure testing requirements of General Design Criteria 36, 37, 39, 40, 42, 43, 45, and 46 and 10 CFR Part 50, Section 50.55a. This conclusion is based on the applicant's or licensee's meeting the requirements of the ASME Boiler and Pressure Vessel Code, Section XI, "Rules for Inservice Inspection of Nuclear Power Plant Components,"⁷⁵ as reviewed, by the staff and determined to be appropriate for this application.

For design certification reviews, the findings will also summarize, to the extent that the review is not discussed in other safety evaluation report (SER) sections, the staff's evaluation of inspections, tests, analyses, and acceptance criteria (ITAAC), including design acceptance criteria (DAC), site interface requirements, and combined license action items that are relevant to this SRP section.⁷⁶

V. IMPLEMENTATION

The following is intended to provide guidance to applicants and licensees regarding the NRC staff's plan for using this SRP section.

This SRP section will be used by the staff when performing safety evaluations of license applications submitted by applicants pursuant to 10 CFR 50 or 10 CFR 52.⁷⁷ Except in those cases in which the applicant or licensee proposes an acceptable alternative method for complying

with the specified portions of the Commission's regulations, the methods described herein will be used by the staff in its evaluation of conformance with Commission regulations.

The provisions of this SRP section apply to reviews of applications docketed six months or more after the date of issuance of this SRP section.⁷⁸

Implementation schedules are defined in Section 50.55a of 10 CFR Part 50 and in reference 12⁷⁹.

VI. REFERENCES

1. 10 CFR Part 50, §50.55a, "Codes and Standards."⁸⁰
2. 10 CFR Part 50, Appendix A, General Design Criterion 36, "Inspection of Emergency Core Cooling System"; ~~Criterion 37, "Testing of Emergency Core Cooling System";~~ Criterion 39, "Inspection of Containment Heat Removal System"; ~~Criterion 40, "Testing of Containment Heat Removal System";~~ Criterion 42, "Inspection of Containment Atmosphere Cleanup Systems"; ~~Criterion 43, "Testing of Containment Atmosphere Cleanup Systems";~~ Criterion 45, "Inspection of Cooling Water Systems"; and Criterion 46, "Testing of Cooling Water System."⁸¹
3. 10 CFR Part 50, Appendix A, General Design Criterion 37, "Testing of Emergency Core Cooling System."
4. 10 CFR Part 50, Appendix A, General Design Criterion 39, "Inspection of Containment Heat Removal System."
5. 10 CFR Part 50, Appendix A, General Design Criterion 40, "Testing of Containment Heat Removal System."
6. 10 CFR Part 50, Appendix A, General Design Criterion 42, "Inspection of Containment Atmosphere Cleanup Systems."
7. 10 CFR Part 50, Appendix A, General Design Criterion 43, "Testing of Containment Atmosphere Cleanup Systems."
8. 10 CFR Part 50, Appendix A, General Design Criterion 45, "Inspection of Cooling Water Systems."
9. 10 CFR Part 50, Appendix A, General Design Criterion 46, "Testing of Cooling Water System."
10. NUREG-0313, Revision 2, "Technical Report on Material Selection and Processing Guidelines for BWR Coolant Pressure Boundary Piping," June 1986.⁸²
11. NUREG-1344, "Erosion/Corrosion Induced Pipe Wall Thinning in U.S. Nuclear Power Plants," April 1989.⁸³

12. NRC Letter to All Licensees of Operating Boiling Water Reactors (BWRs), and Holders of Construction Permits for BWRs, "NRC Position on Intergranular Stress Corrosion Cracking (IGSCC) in BWR Austenitic Stainless Steel Piping (Generic Letter No. 88-01)," January 25, 1988.⁸⁴
13. NRC Letter to All Licensees of Operating Boiling Water Reactors (BWRs), and Holders of Construction Permits for BWRs, "NRC Position on Intergranular Stress Corrosion Cracking (IGSCC) in BWR Austenitic Stainless Steel Piping (Generic Letter No. 88-01, Supplement 1)," February 4, 1992.⁸⁵
14. NRC Letter to All Holders of Operating Licenses or Construction Permits for Nuclear Power Plants, "Erosion/Corrosion-Induced Pipe Wall Thinning (Generic Letter No. 89-08)," May 2, 1989.⁸⁶
152. ASME Boiler and Pressure Vessel Code, Section III, "Rules for Construction of Nuclear Power Plant Components,"⁸⁷ Article NCA-2000, "Classification of Components,"⁸⁸ ~~and Section XI, "Rules for Inservice Inspection of Nuclear Power Plant Components,"~~ Division 1, "Rules for Inspection and Testing of Components of Light-Water Cooled Plants,"⁸⁹ American Society of Mechanical Engineers.
16. ASME Boiler and Pressure Vessel Code, Section XI, "Rules for Inservice Inspection of Nuclear Power Plant Components," Division 1, "Rules for Inspection and Testing of Components of Light-Water Cooled Plants," American Society of Mechanical Engineers.⁹⁰

SRP Draft Section 6.6

Attachment A - Proposed Changes in Order of Occurrence

Item numbers in the following table correspond to superscript numbers in the redline/strikeout copy of the draft SRP section.

Item	Source	Description
1.	Update Branch Review Responsibilities	Revised to reflect that ECGB is currently designated as the primary review branch for this SRP section.
2.	Update Branch Review Responsibilities	Revised to reflect that EMCB is currently designated as the secondary review branch for this SRP section.
3.	Editorial.	Relocated the definition of the acronym "ISI" to the location of first occurrence of the full term "inservice inspection."
4.	Editorial	Deleted characterization of the nature of 50.55a requirements as being "general." 10 CFR 50.55a currently contains fairly specific requirements relating to ISI.
5.	Editorial	Revised to reflect current requirements of 10 CFR 50.55a (specifically paragraph (g)) which specify that components must meet the requirements set forth in Section XI of the ASME Code.
6.	Editorial.	For consistency with other SRP sections, added reference Item number for ASME Code. Generally, reference list Item number is cited when national standard or code is first referred to in SRP text.
7.	Editorial.	Used the previously defined acronym "ISI" in lieu of the full term "inservice inspection."
8.	Editorial - Reference verification.	Updated Article designation to the spelling used in the July 1989 Edition of the ASME Code and added the title, for consistency with citations in the first paragraph of I. Areas of Review. Additionally, added citation of reference Item number.
9.	Editorial.	Relocated these sentences into the Review Interfaces subsection and separated the interfaces to SRP Sections 3.2.2, 5.2.4, and 5.4.2.2 into three separately numbered Items.
10.	Current PRB names and abbreviations.	Editorial change made to reflect current PRB name and responsibility assignment for SRP section 6.6.
11.	Editorial - Reference verification.	Added the title of the Subarticle, for consistency with other citations above.
12.	Editorial - Reference verification.	Added "Article" designation, as defined in the ASME Code in "Organization of Section XI," added citation of IWA-2000 as relevant to this area of review, and added title (same for each Article), for consistency with other Code citations.
13.	Editorial	Revised to reflect that program and schedule information may be included in Technical Specifications, see subsection III.4.

SRP Draft Section 6.6
Attachment A - Proposed Changes in Order of Occurrence

Item	Source	Description
14.	Editorial.	Added "Article" designation, as defined in the ASME Code in "Organization of Section XI."
15.	Editorial, Reference Verification	Added reference to Article IWA-2000 as also applicable and revised punctuation to accommodate the additional citation.
16.	Editorial - Reference verification.	Corrected Article citation to the applicable Article IWA-4000 in the July 1989 Code Edition. In that Edition, Articles IWC-4000 and IWD-4000 are marked "The rules of IWA-4000 apply." Added the title of the Article, for consistency with other citations above.
17.	Editorial.	Added "Article" designation, as defined in the ASME Code in "Organization of Section XI."
18.	Editorial - Reference verification.	Added the title of the Article, for consistency with other citations above.
19.	Editorial - Reference verification.	Added the title of the Article, for consistency with other citations above.
20.	Editorial.	Added "Article" designation, as defined in the ASME Code in "Organization of Section XI."
21.	Editorial - Reference verification.	Added the title of the Article, for consistency with other citations above.
22.	Editorial - Reference verification.	Added the title of the Article, for consistency with other citations above.
23.	Editorial - Reference Verification.	Changed reference to SRP section 3.6.1 into reference to SRP section 3.6.2. SRP section 3.6.2 is the more appropriate reference, since it includes augmented inspections in its Areas of Review, whereas SRP 3.6.1 does not. See PI 25111 for background information.
24.	Editorial, Reference Verification	Added "Subsubarticle" designation as defined in the ASME Code in "Organization of Section XI," added citation of IWD-1220 covering exemptions for Class 3 items, and added title, for consistency with other portions of this SRP section.
25.	SRP-UDP format item, Reformat Areas of Review.	Added "Review Interfaces" heading to Areas of Review. Reformatted existing description of review interfaces in numbered format to describe how EMCB reviews the ISI program under other SRP sections and how other review branches support the review.
26.	SRP-UDP format item, Reformat Areas of Review.	Relocated and reformatted the last sentence in "Components Subject to Examination" (Item 1 under Areas of Review), into Review Interfaces subsection.

SRP Draft Section 6.6
Attachment A - Proposed Changes in Order of Occurrence

Item	Source	Description
27.	SRP-UDP format item, Reformat Areas of Review.	Relocated and reformatted the penultimate sentence in "Components Subject to Examination" (Item 1 under Areas of Review), into a numbered Review Interface Item. Also updated the interface description to reflect the review currently performed under SRP Sections 3.2.2 and 5.2.1.1. The classification review performed thereunder does not reference Article NCA-2000 of the ASME Code.
28.	SRP-UDP Integration of Bolting Issues, Potential Impacts 1009 and 7642	Added a review interface reflecting reviews of bolting and threaded fastener programs under new SRP Section 3.13.
29.	SRP-UDP format item, Reformat Areas of Review.	Relocated and reformatted the last sentence in "Components Subject to Examination" (Item 1 under Areas of Review), into numbered Review Interface Item 3.
30.	Potential Impact 7682	Added a Review Interface to SRP 9.2.1 for review of surveillance and testing programs for service water systems in accordance with Generic Letter 89-13.
31.	Editorial	Revised to reflect standard SRP-UDP discussion of the criteria and reviews detailed in other SRP Sections in Areas of Review, Review Interfaces.
32.	Editorial	Revised for consistency with current guidance regarding component classification and inclusion in inspection programs addressing Code Class component inspection requirements. Since the SRP-UDP could not find a current regulatory basis for use of NCA-2000 (versus NRC quality group classification) for component classification for inspection requirements determination purposes nor a basis for eliminating the citation of NCA-2000 (the last such citation in the SRP), the criterion was revised to reflect that the NRC classification system (intended to include associated positions regarding use of required codes and standards corresponding to the classification), NCA-2000, or both may be used for component classification.
33.	Editorial - Reference verification.	Updated Article designation to the spelling used in the July 1989 Edition of the ASME Code and added the title, for consistency with other citations above.
34.	Editorial	Revised to reflect the review currently performed in SRP Section 3.2.2 which does not involve evaluation of "interpretations."
35.	Editorial	Revised to reflect PRB acronym established previously.

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Item	Source	Description
36.	Editorial	It should be noted that there are staff positions and precedents regarding different inspection requirements than a one-to-one correspondence between the component classification and the corresponding rules of Section XI of the Code for the Code Class. Such positions are reflected in regulatory guides (e.g., Regulatory Guide 1.72 recommends Section XI Class 3 inspection requirements for thermosetting resin spray pond pipe regardless of the Code Class of the pipe) or other SRP sections for review of affected systems [e.g., SRP Section 9.1.3, subsection II.1.a reflects that the spent fuel pool cooling system should be designed to Quality Group C (i.e., Code Class 3) requirements, however, when not designated Category I it need not meet the requirements of ASME Section XI] and therefore need not be explicitly detailed in SRP Section 6.6. Where exceptions are proposed, the applicant should clearly convey the component classification and inspection requirements in the SAR and cite the justification (e.g., per criterion II.1.a of SRP Section 9.1.3, the spent pool cooling system is a quality group C, Code Class 3, non-seismic Category I system to which ASME Section XI requirements are not applied) and where acceptable, the staff should characterize such a situation as a Code Class 3 system to which no Section XI inspection requirements will be applied rather than an "interpretation of code classification."
37.	Editorial - Reference verification.	Added "Article" designation as defined in the ASME Code in "Organization of Section XI." Updated Article designation to that used in the July 1989 Edition of the ASME Code. Added "Code" to "Section III" to avoid ambiguity with subsection III, Review Procedures. Also added the preferred option of reference to SRP Section 3.2.2.
38.	Editorial.	Added "Article" designation, as defined in the ASME Code in "Organization of Section XI."
39.	Editorial, Reference Verification	Revised for consistency with criteria statement in SRP Section 5.2.4 and with the Areas of Review stated in subsection I.2 of this SRP section.
40.	Editorial.	Added "Article" designation, as defined in the ASME Code in "Organization of Section XI."
41.	Editorial, Reference Verification	Added reference to Article IWA-2000 as also applicable and revised punctuation to accommodate the additional citation.
42.	Editorial.	Added "Article" designation, as defined in the ASME Code in "Organization of Section XI."
43.	Editorial, Reference Verification	Added reference to Article IWA-2000 as also applicable and revised punctuation to accommodate the additional citation.
44.	Editorial	Spelled out the acronym PSI at its point of first use in this SRP section.

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Item	Source	Description
45.	Editorial.	Added "Article" designation, as defined in the ASME Code in "Organization of Section XI."
46.	Editorial, Reference Verification	Added the title of the Article, for consistency with other citations in this SRP section.
47.	Editorial.	Added "Article" designation, as defined in the ASME Code in "Organization of Section XI."
48.	Editorial, Reference Verification	Added the title of the Article, for consistency with other citations.
49.	Editorial, Reference Verification	Added the title of the Article, for consistency with other citations.
50.	Integrated impact #294.	Updated Acceptance Criteria to add discussion of personnel qualification and requalification requirements in Division 1, Section XI of ASME Code, including mandatory Appendix VII to Section XI, similar to changes made under ROC 492 in SRP Section 5.2.4.
51.	Editorial	Revised to reflect that required pressure tests must also be completed.
52.	Editorial, Reference Verification	Added reference to Article IWA-2000 as also applicable and revised punctuation to accommodate the additional citation.
53.	Editorial.	Added "Article" designation, as defined in the ASME Code in "Organization of Section XI."
54.	Editorial, Reference Verification	Revised for consistency with areas of review and with similar criteria in SRP Section 5.2.4 where repair procedure criteria is stated for Class 1 components.
55.	Editorial.	Added "Article" designation, as defined in the ASME Code in "Organization of Section XI."
56.	Editorial, Reference Verification	Added the title of the Article, for consistency with other citations.
57.	Editorial, Reference Verification	Added the title of the Article, for consistency with other citations.
58.	Editorial, Reference Verification	Added "Subsubarticle" designation as defined in the ASME Code in "Organization of Section XI," added citation of IWD-1220 covering exemptions for Class 3 items, and added title, for consistency with other portions of this SRP section.
59.	SRP-UDP Format Item, Develop Technical Rationale.	Added Technical Rationale for Acceptance Criteria. Technical Rationale is a new feature added to the SRP.
60.	Editorial	Revised to reflect that multiple procedures are used and to reflect that there are now more procedures than areas of review.

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Item	Source	Description
61.	Editorial	Class 2 and Class 3 components are reviewed, thus removed allusion limited to Class 2 components.
62.	Editorial	Revised to reflect a procedure verifying acceptable inclusion of required components in the ISI program rather than a verification of acceptable component classification.
63.	Editorial, Update to use PRB acronyms	Revised to accurately characterize the review of component classification performed by EMEB under SRP Section 3.2.2. The acceptance criteria and review methods for determining the acceptability of component classifications for all pressure-retaining components is covered under SRP Section 3.2.2. Generally, there should be no discrepancies between SRP Section 3.2.2 component classifications and classifications evaluated in this SRP section (i.e. there should be one classification that is acceptable for each component), therefore discussion of discrepancies was deleted.
64.	Editorial	Deleted unnecessary and possibly inconsistent (with respect to current component classification guidance as reflected in SRP Section 3.2.2) detail regarding Class 3 components.
65.	Integrated impact #294.	Updated Review Procedures to add discussion of training and requalification requirements provided in Division 1, Section XI of the ASME Code, July 1989 Edition or later.
66.	Integrated impact #294.	Updated Review Procedures to add discussion of performance demonstration requirements for ultrasonic test equipment pursuant to Appendix VIII to Section XI, Division 1 of the ASME Code. Appendix VIII to Division 1 was introduced with the March 1990 Code Addenda.
67.	Integrated impact #293.	Updated Review Procedures to add reference to Generic Letter 89-08 and to NUREG-1344 (in lieu of adding reference to future Subsection IWH of Division 1, Section XI of ASME Code, which has not yet been issued) for corrosion/erosion monitoring of high energy piping.
68.	Editorial.	Replaced the term "inservice inspection" with the appropriate acronym, for consistency with the rest of this SRP Section.
69.	Editorial.	Replaced the term "inservice inspection" with the appropriate acronym, for consistency with the rest of this SRP Section.
70.	Editorial, Reference Verification	Added "Subsubarticle" designation as defined in the ASME Code in "Organization of Section XI," added citation of IWD-1220 covering exemptions for Class 3 items, and added title, for consistency with other portions of this SRP section.
71.	Integrated Impact # 295.	Added discussion of GL 88-01, Supplement 1 to GL 88-01, and NUREG-0313, Revision 2 to Review Procedures to assure that staff positions concerning augmented inspections for intergranular stress corrosion cracking are adequately addressed.

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Item	Source	Description
72.	SRP-UDP Guidance, Implementation of 10 CFR 52	Added standard paragraph to address application of Review Procedures in design certification reviews.
73.	Editorial	Revised to eliminate use of a gender specific pronoun.
74.	Editorial	Revised to eliminate use of a gender specific pronoun.
75.	Editorial, Reference Verification	Added title of Section XI to make this citation consistent with other, similar passages of the SRP.
76.	SRP-UDP format item, make editorial changes to implement 10 CFR 52 process.	Added discussion of additional items that should be reflected in Evaluation Findings for DC and COL application reviews.
77.	SRP-UDP Guidance, Implementation of 10 CFR 52	Added standard sentence to address application of the SRP section to reviews of applications filed under 10 CFR Part 52, as well as Part 50.
78.	SRP-UDP Guidance	Added standard paragraph to indicate applicability of this section to reviews of future applications.
79.	Editorial	Added clarification that Generic Letter 88-01 includes implementation schedules for augmented inspections.
80.	Editorial.	Added 10 CFR 50.55a as a reference.
81.	Editorial.	Separated single reference list item covering several General Design Criteria into separate list items, with one Criterion per item.
82.	Integrated Impact # 295.	Added NUREG-0313 as a reference.
83.	Integrated Impact # 293.	Added NUREG-1344 as a reference.
84.	Integrated Impact # 295.	Added Generic Letter 88-01 as a reference.
85.	Integrated Impact # 295.	Added Supplement to Generic Letter 88-01 as a reference.
86.	Integrated Impact # 293.	Added Generic Letter 89-08 as a reference.
87.	Editorial - Reference verification.	Updated title to wording used in the July 1989 Edition of the ASME Code.
88.	Editorial - Reference verification.	Updated Article designation to the spelling used in the July 1989 Edition of the ASME Code and added title, for consistency.
89.	Editorial.	Separated Code Sections III and XI into two separate references, since they address different, unrelated topics. Section III deals with design and construction requirements, providing procedures for assuring attainment of a defined set of quality attributes at the beginning of plant life, while Section XI deals with aging phenomena, providing procedures for maintaining initially established quality attributes over long intervals of operating time.

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Item	Source	Description
90.	Editorial.	Separated Code Sections III and XI into two separate references, since they address different, unrelated topics. Section III deals with design and construction requirements, providing procedures for assuring attainment of a defined set of quality attributes at the beginning of plant life, while Section XI deals with aging phenomena, providing procedures for maintaining initially established quality attributes over long intervals of operating time.

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Attachment B - Cross Reference of Integrated Impacts

Integrated Impact No.	Issue	SRP Subsections Affected
293	Modify Review Procedures to provide guidance for application of ASME Section XI, Subsection IWH for examination of piping susceptible to wall thinning due to erosion/corrosion.	III. Review Procedures (Item 3, added reference to GL 89-08 and to NUREG-1344 in lieu of reference to not-yet-issued Subsection IWH of the ASME Code). VI. References (Items 11 and 14).
294	Modify Review Procedures to provide guidance for application of ASME Section XI, Appendices VII and VIII for qualification of personnel and performance demonstration of ultrasonic examination systems.	II. Acceptance Criteria Item 3.c and III. Review Procedures (Item 3).
295	Develop Review Procedures to address augmented inspection of austenitic stainless steel piping in BWRs.	III. Review Procedures (Item 10) and VI. References (Items 10, 12, and 13).
1249	Revise the SRP to reflect update of 10 CFR 50.55a under the proposed rulemaking published at 59 FR 979.	No changes.